Journal of Physics: Conference Series 2018 vol.1038 N1

# Sensitivity and directivity measurement of ultrasonic transducer with polymer-powder matching layer

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## Abstract

© Published under licence by IOP Publishing Ltd. The results of an experimental study of the sensitivity and directivity pattern of the ultrasonic transducers are presented. Data was obtained for transducers with central frequency at 2.5 and 5 MHz with protective matching layers, in comparison with transducers without matching layers. Increase of transducer sensitivity is shown. In addition, it is shown that the directivity patterns for transducers with the matching layer and without it are practically identical. Also was observed that the directivity pattern gets sharper as the frequency of the transducer increases.

http://dx.doi.org/10.1088/1742-6596/1038/1/012109

## References

[1] Denisov E S, Temyanov B K, Sagdiev R K and Fazlyyyakhmatov M G 2014 IOP Conf. Series: Mater. Sci. Eng. 69 012014

[2] Sagdiev R K, Denisov E S, Evdokimov Yu K, Fazlyyyakhmatov M G and Kashapov N F 2014 IOP: Conf. Ser. Mater. Sci. Eng. 69 012012

[3] Khan A, Abas Z, Soo Kim H and Oh I K 2016 Smart Mater. Struct. 25 053002

[4] Zhang S, Li F, Jiang X, Kim J, Luo J and Geng X 2015 Prog. Mater Sci. 68 1-66

[5] Zhou Q, Lau S, Wu D and Shung K K 2011 Prog. Mater Sci. 56 139-174

[6] Gavrilova V A, Fazlyyyakhmatov M G and Kashapov N F 2014 J. Phys.: Conf. Series 567 012023

[7] Fazlyyyakhmatov M and Kashapov N 2014 High Temperature Material Processes 18 273-279

[8] Gavrilova V A, Fazlyyyakhmatov M G and Kashapov N F 2013 J. Phys.: Conf. Series 479 012010

[9] Xiao D, Fan Q, Xu C and Zhang X 2016 Ultrasonics 68 150-154

[10] Dang C, Schmerr L W and Sedov A 2002 Res. Nondestr. Eval. 14 203-228

[11] Van Neer P L M J, Vos H J and De Jong N 2011 Ultrasonics 51 1-6

[12] Luker L D and Buren V 1981 J. Acoust. Soc. Am. 70 516-519

[13] Lopez-Sanchez A L and Schmerr L W 2006 IEEE Trans. Ultrason. Ferroelectr. Freq. Contr. 53 2101-2112

[14] Bacon D R 1988 IEEE Trans. Ultrason. Ferroelectr. Freq. Contr. 35 157-160

[15] Everitt S J and Humphrey V F 2000 Ultrasonics 38 118-121

[16] Moles D C 2004 Introduction to Phased Array Ultrasonic Technology Applications (Waltham, MA: Olympus NDT)

[17] Umchid S 2009 International Journal of Applied Biomedical Engineering 2 39-43